

1

SEQUENCE LISTING

<110> Punnonen, Juha
Stemmer, Willem P.C.
Whalen, Robert Gerald
Howard, Russell
Maxygen, Inc.

<120> Optimization of Immunomodulatory Properties of Genetic
Vaccines

<130> 018097-030300US

<140> US 09/248,716

<141> 1999-02-10

<150> US 60/074,294

<151> 1998-02-11

<160> 6

<170> PatentIn Ver. 2.0

<210> 1

<211> 3632

<212> DNA

<213> Homo sapiens

<220>

<223> human interleukin 10 receptor (IL-10R)

<400> 1

```
aaagagctgg aggcggcgag gccggctccg ctccggcccc ggacgatgag gcgcgcocag 60
gatgctgccc tgccctcgtag tgctgctggc ggcgctccct agcctccgtc ttggctcaga 120
cgctcatggg acagagctgc ccagccctcc gtctgtgtgg tttgaagcag aatttttcca 180
ccacatccct cactggacac ccattccaaa tcagtctgaa agtacctgct atgaagtggc 240
gtccctgagg tatggaatag agtccctggaa ctccatctcc aactgtagcc agaccctgtc 300
ctatgacctt accgcagtga ccttggacct gtaccacagc aatggctacc gggccagagt 360
gcgggctgtg gacggcagcc ggcactccaa ctggaccgtc accaaccacc gcttctctgt 420
ggatgaagtg actctgacag ttggcagtgt gaacctagag atccacaatg gcttcatcct 480
cgggaagatt cagctaccca ggcccaagat ggcccocgag aatgacacat atgaaagcat 540
cttcagtcac ttccgagagt atgagattgc cattcgcaag gtgcccggaa acttcacgtt 600
cacacacaag aaagtaaaac atgaaaactt cagcctccta acctctggag aagtgggaga 660
gttctgtgtc caggtgaaac catctgtcgc ttcccgaaat aacaagggga tgtgggtcaa 720
agaggagtgc atctccctca ccaggcagta ttccaccgtg accaagctca tcatorttct 780
tgccrttgtc ctgctgtctt ccggagccct cgcctactgc ctggccctcc agctgtatgt 840
gcggcgccga aagaagctac ccagtgtcct gctcttcaag aagcccagcc ccttcatctt 900
catcagccag cgtccctccc cagagaccca agacaccatc cacccgcttg atgaggaggc 960
ctttttgaag gtgtccccag agctgaagaa cttggacctg caccgcagca cagacagtgg 1020
ctttggcagc accaagccat ccttgcagac tgaagagccc cagttccctc tccctgacct 1080
tcacccccag gctgacagaa cgctgggaaa cggggagccc cctgtgctgg gggacagctg 1140
cagtagtggc agcagcaata gcacagacag cgggatctgc ctgcaggagc ccagcctgag 1200
ccccagcaca gggccacact gggagcaaca ggtggggagc aacagcaggg gccaggatga 1260
cagtgccatt gacttagttc aaaaactctg gggccgggct ggggacacac aggggtggctc 1320
ggccttgggc caccacagtc ccccggaagc tgaggtgccc ggggaagaa acccagctgc 1380
tgtggcattc caggggtacc tgaggcagac cagatgtgct gaagagaagg caaccaagac 1440
aggctgcctg gaggaagaat cgcccttgac agatggcctt ggccccaaat tcgggagatg 1500
cctgggttgat gaggcaggct tgcattccacc agccctggcc aagggctatt tgaacagga 1560
tcccttagaa atgactctgg ctctctcagg gggcccaacg ggacagtgg accagccac 1620
tgaggaatgg tcactcctgg ccttgagcag ctgcagtgc ctgggaatat ctgactggag 1680
ctttgcccac gaccttgccc ctctaggctg tgtggcagcc ccaggctggtc tccctggcag 1740
```

2

```
ctttaactca gacctgggtca cccctgcccc catctctagc ctgcagtcaa gtgagtgact 1800
cgggctgaga ggctgctttt gatcttagcc atgcctgctc ctctgacctg accagggagg 1860
ggggccctggg gcagaagtta ggcacgaggc agtctgggca cttttctgca agtccactgg 1920
ggctggccca gccaggctgc agggctgggc aggggtgtctg gggcaggagg aggccaaactc 1980
actgaactag tgcagggtat gtgggtggca ctgacctgtt ctgttgactg gggccctgca 2040
gacctgggca gagctgagaa gggcagggac cttctccctc ctaggaaactc tttcctgtat 2100
cataaaggat tatctgctca ggggaacctt ggggctttct ggagtgtggg tgaggccacc 2160
aggctgaagt cagctcagac ccagacctcc ctgcttaggc cactcgagca tcagagcttc 2220
cagcaggagg aagggtgta ggaatggaag cttcaggggc ttgctgctgg ggtcattttt 2280
aggggaaaaa ggaggatatt atgggtcacat ggggaacctc cctcctcagg gctctgggg 2340
caggaaagctt gtcactggaa gatcttaagg tatatatttt ctggacactc aaacacatca 2400
taatggattc actgagggga gacaaaggga gccgagacct tggatggggc ttcagctca 2460
gaacccatcc ctctgggtggg tacctctggc acccatctgc aaatatctcc ctctctccaa 2520
caaattggagt agcatcccc tggggcactt gctgaggcca agccactcac atcctcactt 2580
tgctgccccca ccattcttgc gacaaacttc agagaagcca tgggtttttg tatcggtcat 2640
aactcagccc tttggggggc ctctggggtt gggcaccagc tcatgccagc cccagagggt 2700
cagggttggg ggcctgtgct tgtgtttgct gctaatgtcc agctacagac ccagaggata 2760
agccactggg cactgggtct gggctccctgc cttgttgggt ttcagctgtg tgattttgga 2820
ctagccactt gtcagagggg ctcaatctcc catctgtgaa ataaggactc cactcttagg 2880
ggacctccca tgtttgctgg gtattagcca agctggctct gggagaatgc agatactgtc 2940
cgtggactac caagctggct tgtttcttat gccagaggct aacagatcca atgggagtcc 3000
atggtgtcat gccaaagacag tatcagacac agccccagaa gggggcatta tgggccccgc 3060
ctccccatag gccatttggg ctctgctctc aaacaaaggc agttcagtc acaggcatgg 3120
aagctgtgag gggacagggc tgtgctgccc atccagagtc atctcagccc tgcctttctc 3180
tgagagcttc tgaaaacaga tattctggcc cagggaatcc agccatgacc cccacccctc 3240
tgccaaagta ctcttaggtg ccagtctggt aactgaactc cctctggagg caggcttgag 3300
ggaggattcc tcagggttcc cttgaaagct ttatttattt atttgttca tttatttatt 3360
ggagaggcag cattgcacag tgaagaatt ctggatatct caggagcccc gaaattctag 3420
ctctgacttt gctgtttcca gtggtatgac cttggagaag tcacttatcc tcttggagcc 3480
tcagtttcct catctgcaga ataatgactg acttgtctaa ttcataggga tgtgaggttc 3540
tgctgaggaa atgggtatga atgtgcttg aacacaaage tctgtcaata agtgatacat 3600
gttttttatt ccaataaatt gtcaagacca ca 3632
```

<210> 2

<211> 3497

<212> DNA

<213> Mus musculus

<220>

<223> mouse interleukin 10 receptor (IL-10R)

<400> 2

```
ccattgtgct ggaaagcagg acgcgcgggc cggaggcgta aaggccggct ccagtggacg 60
atgcgcctgt gcgcccagga tgtgtctgog tttgtctcca ttcctcgtoa cgatctccag 120
cctgagccta gaattcattg catacgggac agaactgccca agcccttccr atgtgtgggt 180
tgaagccaga tttttccagc acatccctca ctggaacctt atcccaaac agtctgagag 240
cacctactat gaagtggccc tcaaacagta cggaaactca acctgggaatg acatccatat 300
ctgtagaaaag gctcaggcat tgcctgtgta tctcacaacg ttcacctggg atctgtatca 360
ccgaagctat ggctaccggg ccagagtccg ggcagtggac aacagtccag actccaaactg 420
gaccaccact gagactcgtc tcacagtggg tgaagtgtatt ctgacagtgg atagcgtgac 480
tctgaaagca atggacggca tcatctatgg gacaatccat ccccccaggc ccacgataac 540
ccctgcaggg gatgagtacg aacaagtctt caaggatctc cgagtttaca agatttccat 600
ccggaagtct tcagaactaa agaattgcaac caagagagtg aaacaggaaa ccttcacctt 660
ccgggtcccc atagggttga gaaagtcttg tgtcaagggt ctgccccgct tggaaatccc 720
aattaacaag gcagagtggg cggaggagca gtgtttactt atcacgacgg agcagtattt 780
cactgtgacc aacctgagca tcttagtcac atctatgctg ctattctgtg gaatccctgt 840
ctgtctgggt ctcagtggtt acatccggca cccgggggag ttgctctacg tcttgggtct 900
caagaagcct cactgactct cccagcccaa cctctctgct ccagaaactc ccgattgccat 960
tcacatctgt gacctggagg ttttcccaaa ggtgtcacta gagctgagag actcagctct 1020
gcatggcagc accgacagtg gctttggcag tggtaaacca tcacttcaga ctgaaagagtc 1080
ccaattccct ctcctgggtt cccacccccca gatcacgggg actctgggaa aagaagagtc 1140
```

3

```
tccagggccta caggccacct gtggggacaa cacggacagt gggatctgcc tgcaggagcc 1200
cggcttacac tccagcatgg gggccgcctg gaagcagcag ctggatata cccatcagga 1260
ccaggatgac agtgacgtra acctagcca gaactctcca gggcagccta agtacacaca 1320
ggatgcgact gccttgggcc atgtctgtct cctagaacct aaagccctg aggagaaaga 1380
ccaagtcatg gtgacattcc agggctacca gaaacagacc agatggaaag cagaggcagc 1440
aggcccgaca gaatgcttgg acgaagagat tcccttgaca gatgcctttg atcctgaact 1500
tggggtacac ctgcaggatg atttggcttg gectccacca gctctggccg caggttattt 1560
gaaacaggag tctcaaggga tggcttctgc tccaccaggg acaccaagta gacagtggaa 1620
tcaactgacc gaagagtggg cactcctggg tgtggttagc tctgaagatc taagcataga 1680
aagttagagg ttgcccata aacttgaccc tctggactgt ggggcagccc ctggtggcct 1740
cctggatagc ctggtcteta acctggtcac cctggccttg atctccagcc tgcaggtaga 1800
agaatgacag cggctaagag ttatttgrat tccagccatg cctgctcccc tccctgtacc 1860
tgggagggctc aggagtcaaa gaaatatgtg ggtcccttcc tgcagacctc ctgtgaccag 1920
ctgaactgagc tccacggggc aaggaaaaggc catcttgata cacgagtgct aggtacatga 1980
gaggttctgg ctagtctgct gagttagggg ctgtagatac cagcagagct gaggcaggat 2040
gacagagacc tctcatgccc tcagggtctg ctctacactc ggaaggacct gtgtttgggt 2100
gtaacctcag ggtttctgg atgtgttaag actgtaggtc tgaagtcagc tgagcctgga 2160
tgtctgcgga ggtgttggag tggctagcct gctacaggat aaagggaagg ctcaagagat 2220
agaaggggcag agcatgagcc aggttttaatt ttgtcctgta gagatggctc ccagccagga 2280
tgggttactt gtggctggga gatcttgggg tatacaccac cctgaatgat cagccagtca 2340
attcagagct gtgtggcaca agggactgag acccagaatt tctgttcctc ttgtgagggt 2400
tctctgctac ccatctgcag acagacatct tcatcttttt actatggctg tgtcccctga 2460
attaccagca gtggccaagc cattactccc tgcctgctac tgttgtgacg tcagaccaga 2520
ccagacgctg tctgtctgtg ttagtacctc accttttagg tggcctttgg gcttgagcac 2580
tggcccaggc ttaggactra tgtctgcttt tgetgctaat ctctaactgc agaccagag 2640
aacagggtgc tgggctgaca cctccgtgtt cagctgtgtg acctccgacc agcagcttcc 2700
tcagggggact aaaataatga ctaggctcatt cagaagtccc tcatgctgaa tgttaacca 2760
ggtgccccctg gggtagatgt ttaggtcctg caacctctgg gttggaaggga agtggactac 2820
ggaagcccatc tgtccccctg gggagcttcc acctcatgcc agtgtttcag agatcttgtg 2880
ggagccctagg gccttgtgcc aaggagctg ctagtccctg gggctctagg ctggtccctg 2940
cctccctata ctgcgtttga gacctgtctc caaatggagg cagtttgacg cccctaagca 3000
aggatgctga gagaagcagc aaggctgctg atccctgagc ccagagtttc tctgaagctt 3060
tccaaataca gactgtgtga cggggtgagg ccagccatga accttggcat cctgcccaga 3120
aggctcatgac cctaactcgg taccagagct ccttctggaa ctgggcaagc tctttgagac 3180
ccccctggaa cctttattta tttatttgc caottattta ttgaggaagc agcgtggcac 3240
aggcgcaagg ctctgggtct ctacggaggt ctagatttgc ctgccctgtt tctagctgtg 3300
tgaccttggg caagtcaagt tccctcgtgg agcctcagtt ttctgtctg tatgcaaagc 3360
ttggaaattg aaatgtacct gacgtgctcc atccctagga gtgctgagtc ccactgagaa 3420
agcgggcaca gacgcctcaa atggaaccac aagtgggtgt tgtttcattc ctaataaaaa 3480
gtcagggtgt ttgtgga 3497
```

<210> 3
<211> 867
<212> DNA
<213> Homo sapiens

<220>
<223> human B7-1 (CD80)

```
<400> 3
atggggccaca caggagggca gggaacatca ccatccaagt gtccatacct caattttottt 60
cagctctctgg tgcctggctgg tctttctcac ttctgttcag gtgttatcca cgtgaccaag 120
gaagtgaagg aagtggcaac gctgtcctgt ggtcacaatg tttctgttga agagctggca 180
caaactcgca tctactggca aaaggagaag aaaatgggtg tgaactatgat gtctggggac 240
atgaatatat gggccgagta caagaaccgg acctcttttg atatcactaa taacctctcc 300
attgtgatcc tggctctgcy cccatctgac gagggcacat acgagtgtgt tgttctgaag 360
tatgaaaaag acgctttcaa ggggaaacac ctggttgaag tgacgttate agtcaaaagct 420
gacttcccta cacttagtat atctgacttt gaaatcccaa ctctcaatat tagaaggata 480
atttgcctcaa cctctggagg tttccagag cctcacctct cctgggttga aaatggagaa 540
gaatttaaatg ccatcaacac aacagtttcc caagatcctg aaactgagct ctatgctgtt 600
agcagcaaac tggatttcaa tatgacaacc aaccacagct tcatgtgtct catcaagtar 660
```

4

ggacatttaa gagtgaatca gaccttcaac tggaaatacaa ccaagcaaga gcattttcct 720
gataacctgc tcccatcctg ggccattacc ttaatctcag taaatggaat ttttctgata 780
tgctgcctga cctactgctt tgcctcaaga tgcagagaga gaaggaggaa tgagagattg 840
agaaggga aa gtgtacgcc tgtataa 867

<210> 4

<211> 867

<212> DNA

<213> Macaca mulatta

<220>

<223> rhesus monkey B7-1 (CD80)

<400> 4

atggggccaca cacggaggca ggaaatatca ccatccaagt gtccatacct caagtctctt 60
cagctctcttg tgctggcttg tctttctcat ttctgttcag gtgttatcca cgtgaccaag 120
gaagtga aa agtggaac gctgtcctgt ggtcacaatg ttctgttga agagctggca 180
caaaactcgca tctactggca aaaggagaag aasatggtgc tgaactatgat gtctggggac 240
atgaatatat ggcccagat caagaaccgg accatctttg atatcacaaa taacctctcc 300
atttgtattc tggtctctgc cccatctgac gagggcacat acgagtgtgt tgttctgaag 360
tatgaaaaag atgctttcaa gcgggaacac ctggctgaag tgatgttatc cgtcaaaagt 420
gacctcccta cactagat aactgactct gaattccac ctcttaacat tagaaggata 480
atttgtctaa actctggagg ttttccagag cctcacctct cctgggttga aaatggagaa 540
gaattaaatg ccatcagcac aacagtttcc caagatcctg aaactgagct ctatactgtt 600
agcagcaaac tggatttcaa tatgacaacc aatcacagtt tcatgtgtct catcaagtat 660
ggacatttaa gagtgaatca gaccttcaac tggaaacacac ccaagcaaga gcattttcct 720
gataacctgc tcccatcctg ggccattatc ctaatctcag taaatggaat ttttctgata 780
tgctgcctga cctactgttt tgcctcaagg tgcagagaga gaagaaggaa tgagacattg 840
agaaggga aa gtgtacgcc tgtatga 867

<210> 5

<211> 900

<212> DNA

<213> Rabbit (genus and species unknown)

<220>

<223> rabbit B7-1 (CD80)

<400> 5

atggggccaca cgctgaggcc gggaaactcca ctgcccagggt gtctacacct caagctctgc 60
ctgctcttg cgctggcggg tctccacttc tcttcaggta tcagccagggt caccaagtgc 120
gtgaaagaaa tggcagcact gtcctgtgat tacaacattt ctatcgatga actggcgaga 180
atgctgcatat actggcagaa ggaccaacag atggtgtgta gcatcatctc tgggcaagtg 240
gaagtgtggc ctgagtacaa gaaccgcacc tcccccagca tcattaacaa cctctccctt 300
atgatcctgg cactgcgcct gtcggacaag ggcaacctaca cctgcgtggt tcagaagaat 360
gagaacgggt ctttcagacg ggagcacctg acctccgtga cactgtccat cagagctgac 420
ttccctgtcc ctagcataac tgacattgga catcccgacc ctaatgtgaa aaggataaga 480
tgctcgcct ctggaggrrt tccagagcct cgccctcgcc ggatggaaga tggagaagaa 540
ctaaacgccg tcaaacagac ggttgaccag gatttgaca cggagctcta cagcgtcagc 600
agtgaactgg atttcaatgt gacaaataac cacagcatcg tgtgtctcat caaatacggg 660
gagctgtcgg tgtcacagat ctcccttg agcaaaccce agcaggagcc tcccatctat 720
cagcttccat tctgggtcat tatcccagta agtgggtgctt tgggtgtcac tgcgtagtt 780
ctctactgcc tggcctgcag acatgttgcg aggtggaaa gaacaagaag gaatgaagag 840
acagtgggaa ctgaaaggct gtccctatc tacttaggct ctgcgcaatc ctgggctga 900

<210> 6

<211> 102

<212> PRT

<213> Artificial Sequence

5

<220>

<223> Description of Artificial Sequence:truncated
hepatitis B surface antigen (HBsAg) (PreS2 plus S
regions)

<400> 6

Met Gln Trp Asn Ser Thr Thr Phe His Gln Thr Leu Gln Asp Pro Arg
1 5 10 15

Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val
20 25 30

Asn Pro Val Leu Thr Thr Ala Ser Pro Leu Ser Ser Ile Phe Ser Arg
35 40 45

Ile Gly Asp Pro Ala Leu Asn Met Glu Asn Ile Thr Ser Gly Phe Leu
50 55 60

Gly Pro Leu Leu Val Leu Gln Ala Gly Phe Phe Leu Leu Thr Arg Ile
65 70 75 80

Leu Thr Ile Pro Gln Ser Leu Asp Ser Trp Trp Thr Ser Leu Asn Phe
85 90 95

Leu Gly Gly Thr Thr Val
100